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May 5-15-04

**IN THE CLAIMS:**

1. (previously presented) A method for scanning for an object within a region, comprising:

scanning the region using a conformal scanning scheme, said scanning comprising:

determining a characteristic geometry of the region;

performing a conformal mapping between the characteristic geometry of the region and a first scanning curve to generate a conformal scanning curve based on said characteristic geometry, wherein the first scanning curve is comprised in a first geometry, wherein the first geometry is different from the characteristic geometry of the region, wherein the first scanning curve comprises a sequence of points in the first geometry, and wherein said performing a conformal mapping between a characteristic geometry of the region and a first scanning curve comprises:

determining a mapping function which maps each point in the first geometry to a corresponding point in the characteristic geometry; and

applying the mapping function to each point in the sequence of points in the first geometry to generate a corresponding sequence of points in the characteristic geometry, wherein the sequence of points in the characteristic geometry comprises the conformal scanning curve; and

measuring the region at a plurality of points along the conformal scanning curve using one or more sensors;

determining one or more characteristics of the object in response to said scanning;

and

generating output indicating the one or more characteristics of the object.

2-4. (cancelled)

5. (previously presented) The method of claim 1, wherein the first scanning curve minimizes one or more of angle deviations and curvature.